6-1-1974

WSU Research News, June 1974

Office of Research Development, Wright State University

CLASSICS DEPARTMENT
433W MILLETT HALL (2)

WRIGHT STATE
Research News
Office of Research Development

June, 1974
Vol. VI., No. 12

GRANTS, CONTRACTS, AND AWARDS

Dr. Arthur Thomas has contracted with the Montgomery County Commissioners through the Juvenile Court to carry out an "Action Seminar for Foster Care Parent's Program." The program is a function of Continuing and Community Education and specifically directed towards covering the needs of foster parents for handling placement of juveniles and providing adequately for proper handling of those placed in foster homes. Project #304 has a total cost of $18,670 with $16,262 from the sponsoring agency. The District Probation Subsidy Program is a part of the Ohio Youth Program and the source of the supporting funds.

Dr. Rubin Battino has received a renewal of his grant program from the National Institute of General Medical Sciences of the National Institutes of Health. This research on "Solubilities of Gases in Selected Solvents and Solutions," is directed toward a better understanding of the permeability of cell membranes and to obtain more information on the liquid state and solutions. Project #305 has a total value of $34,210 with $30,230 from the sponsoring agency.

Dr. Harold Keller has received a grant in the amount of $918 from the Ohio Biological Survey to conduct studies on "The Corticolous Myxomycetes of Ohio." Project #306 is primarily in support of a graduate student covering travel and expenses for field studies relative to this organism.

Dr. Bryan Gregor has contracted with Systems Research Laboratories, Incorporated for the "Conversion of Graphic Strip Chart Data to Digitized Data Cards." Project #307 is primarily for student wages and equipment usage in the processing of these data. Total amount of the contract is $4,862.

Dr. Charles Colbert has received a grant from the National Institute of Environmental Health Sciences of the National Institutes of Health in the amount of $38,507 for direct costs. Project #308 covers research in the area of "Detection of Chronic Lead Poisoning by a Rapid Screening Process." It is proposed that the use of the Computer/Scanner system for quantitatively measuring the lead deposition in bone may be differentiated from the lead content of the blood for symptomatic evaluation of recurrent lead poisoning symptoms.

Dr. Carl Maneri has contracted with the Aerospace Research Laboratories at Wright Patterson Air Force Base for the "Presentation of the Fourth International Symposium on Multivariate Analysis." Project #309 is in the amount of $25,046 and is primarily in support of the speakers and coordinators who will conduct this symposium.

Dr. Marlene Birely has been awarded a grant of $20,000 in support of a program "Non-Categorical Prescriptive Teaching Curriculum for Wright State University." Funds are provided through Title VI - Part D - Handicapped Teacher Education from the Department of Health, Education, and Welfare, Office of Education. Project #310 covers the period from June 1, 1974 through May 31, 1975.

Dr. Paul Pushkar has negotiated with Selco Mining Corporation, Limited, Toronto, for a project in support of a graduate student research study of the petrology and mineralogy of certain rock types in the area of their South Bay mine. The research grant provides $800 plus the cost of thin sections estimated at $500 and provides room and board during visits to the mine. Gerry Koschal, with his thesis advisor, will visit the mine and collect samples this summer.

Dr. Arthur Thomas has received a grant of $3,200 in support of a "Planning Grant Proposal for a Health Oriented Youth Challenge Program." This program is funded by the Office of Policy and Program Development - ACTION. The program is operable from May 20, 1974 through August 31, 1974. Primary purpose of Project #311 is to plan a pilot operation for placement of intersted youth into some aspect of health delivery systems. This will necessitate program and materials development for training and integration of the health services program into regular curricular studies of area schools.

FACULTY RESEARCH

The announcement by the Research Council of the 1974-75 Faculty Research Initiation Grants in the May issue of Research News set a deadline of July 1, 1974 for receipt of applications. Project amounts requested should not exceed $1,200.

ETHICAL AND HUMAN VALUE IMPLICATIONS OF SCIENCE AND TECHNOLOGY

The National Endowment for the Humanities and the National Science Foundation jointly sponsor a limited number of grants in support of research, conferences, colloquia, seminars, and other activities of that nature on how cultural and humanistic values are challenged, modified, or influenced by advances in science and technology.

Proposals may go to either agency.

OHIO PROGRAM IN THE HUMANITIES

The O P H has announced the following deadlines for submission of proposals: for programs starting October 1, 1974 the consulting deadline is June 7, 1974 and the proposal deadline is June 28, 1974; for programs starting November 29, 1974 the consulting deadline is September 20, 1974 and the proposal deadline is October 11 , 1974; for programs starting March 14, 1975 the consulting deadline is January 6, 1975 and the proposal deadline is January 24, 1975.

The goal of these programs is to improve the quality and increase the quantity of public programs in the humanities, in order to increase public awareness of the value of applying humanistic learning, insights, and perspectives to issues of public policy.

The Ohio program is based on the general concept "Unity through Diversity in American Life." The aspect of this theme chosen as the focus for proposals is "Justice, Law, and Public Opinion." Funding for the state is expected to be $300,000.

The Ohio theme for the Bicentennial program proposals for 1974-75 is "Individuals and Institutions: Human Values in a Changing Society."

Anyone desirous of obtaining further information should contact the Office of Research Development.

PUBLIC UNDERSTANDING OF SCIENCE - NSF

The National Science Foundation supports projects in the Public Understanding of Science program which leads to an increase in the knowledge and understanding of science for the general public.

Projects may be in the form of conferences, lectures, films, and seminars; the preparation of popular educational materials; or the development of new public information services. They also support programs which are designed to present science to the public and to programs aimed at improving the knowledge of scientists in fields other than their own.

An informal proposal should be submitted to the office of this program for preliminary evaluation.

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He who laughs last is a damned fool for waiting so long.

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Prejudice - a loose idea, tightly held

CALENDAR OF DEADLINES

JUNE

Museum Programs (Renovation Program, Conservation)	NEA	14
Division of Advanced Energy Research and Technology	NSF	17
Fellowship and Stipend Program (Senior Fellowships)	M 67	17
Research on Wind Energy Conversion Systems A-1	NSF	19
University Teaching and Advanced Research Abroad	L 61	30
Institutional Grants for Research Management Improvement	N 73	30
State Vocational Education Programs and Services	C 21	30
Construction and Remodeling of Vocational Educational Facilities	C 27	30
Cooperative Vocational Education Programs	C 35	30
Work-Study Programs for Vocational Education Students	C 39	30
Special Funds for Vocational Education of the Handicapped	C 44	30
Consumer and Homemaking Education	C 46	30
Oceanographic Facilities and Support	N 64	30
Construction of Undergraduate Academic Facilities (State submission)	D 75	30

JULY

Faculty Research Abroad	E 39	1
Teacher Exchange Program	E 53	1
Special Projects to Improve Nurse Training	F 11	1
Public Education and Awareness Program	NEA	1
Guaranteed Loans and Interest Subsidy to School of Nursing	F 13	1
Exxon Educational Foundation (IMPACT)		1
Special Health Careers Opportunity Grants	F 33	1
Medical Library Resources	G 25	1
Research and Development in the Field of Aging	H 1	1
Manpower Related Doctoral Dissertation Grants	K 60	1
MDTA Research Projects	K 58	1
University Lecturing and Advanced Research Abroad	L 61	1

JULY (continued)

Water Pollution Control Training	M 44	1
Water Pollution Control Research Fellowships	M 45	1
Education Programs (Development and Program Grants)	M 64	1
Oceanographic Facilities and Support (Ship Operations etc.)	N 64	1
Ocean Thermal Energy	NSF	9
Academic Training in Comprehensive Health Planning	F 45	15
Continuing Education in Comprehensive Health Planning	F 49	15
Studies and Demonstrations in Comprehensive Health Planning	F 51	15
Institutional Grants for Science Program	N 51	31

AUGUST

Youthgrants in the Humanities	M 68	1
Research in Maternal and Child Health and Crippled Children's Services	F 55	1
Pre-College Instructional Improvement Implementation Programs 1. Leadership Specialist 2. Teacher Projects 3. School Systems Projects	N 3	1
Education Programs - Development and Program Grants	M 64	1
Intergovernmental Personnel Assignment	O 40	5
Teacher Corps (Concept Paper)	D 67	15
Regional Development and Public Media	NEA	15
International Cooperative Scientific Activities (Seminars U.S. - Japan)	N 47	31

SEPTEMBER

Special Training Projects in Mental Health	G 40	1
International Cooperation Scientific Activities (U.S. - Israel)	N 47	1
State Agricultural Experiment Stations - Research Program	K 29	15
Postdoctoral Research Associateships - National Research Council (NASA)	M 69	15

EDUCATIONAL PROGRAMS

THE NATIONAL SCIENCE FOUNDATION

GUIDE FOR PREPARATION OF PROPOSALS

COLLEGE FACULTY WORKSHOPS

I. GENERAL INFORMATION

INTRODUCTION

The College Faculty Workshop Program is to assist in improving science curricula for undergraduate students of science in colleges and universities. The workshops are to develop, to the stage of practical implementation, educational products of national scope and utility. The improved instructional materials and more effective modes of delivering undergraduate instruction are to be developed with the aid of practicing college faculty. In-service faculty are a significant resource of experiential knowledge of requirements and capabilities of undergraduate students in varying instructional conditions fulfilling a variety of educational objectives, of practical means for tryout and testing of developing materials and technologies, and for expeditious dissemination of the developed educational products for wide-scale implementation in undergraduate classrooms.

PROGRAM OBJECTIVES AND MECHANISMS

The objective of the workshops is to involve college faculty members in preparing course materials and modes of delivery for new advances in science and science instruction and in testing the effectiveness of these science curricular innovations for implementation.

The topic of a workshop may be:

- New material identified by leading specialists in a science area as requiring expeditious incorporation into an undergraduate science curriculum.
- New scientific instructional units whose development has been initiated with Foundation or comparable support and judged to be of such innovative quality as to merit nationwide utility.
- Educational technologies or instructional delivery systems initiated with Foundation or comparable support and judged to be of such efficiency and cost-effectiveness as to merit nationwide dissemination. Priority will be given to modes of delivery emphasizing the student's responsibility for the direction and pace of his learning in a variety of educational options.

Local course content improvements or adaptations are *not* objectives. The topic of a workshop must be of sufficiently broad applicability and impact as to warrant national implementation for the enhancement of undergraduate science curricula. Priority is given to the development of more efficient and effective educational procedures in newly emerging, interdisciplinary, and problem-relevant subject areas.

The director and staff of a workshop project should be specialists with an established interest in science curriculum development as evidenced by involvement in the development of educational products, authoritative familiarity with educational developments, or professional activity in identifying materials or techniques that warrant development.

The number of college faculty participating in a workshop project is determined by such considerations as breadth of subject-matter competence required for the development; amount and variety of instructional experience;

variety of educational situations in which the developed product is to be used; variation in educational objectives to be fulfilled by the educational innovation; opportunities for effective tryouts; and feasibility of dissemination for sufficient impact. Experience suggests that effective working groups do not normally include more than fifteen participants. The participants may be selected in advance so as to insure the necessary commitments and balance of talents or such criteria and procedures established as to be able to select an effective working group from applications. United States college faculty of the biological, physical, or social sciences, mathematics, or engineering in universities, liberal arts colleges, two-year colleges, community colleges, teachers colleges, engineering schools, and technical institutes are eligible to be considered for participation in a workshop project.

The locale and facilities available to the project are expected to be as appropriate as possible to the requirements and conditions of the educational product to be developed.

As may be dictated by the requirements of the activity and the stage of development of the educational product, the workshop may be concentrated in a single session or involve a series of sessions in the summer or during the academic year. The workshop may be held at one site (at the host institution or some selected installation) or at a group of centers. When a series of sessions at various sites is warranted by the objectives of the project, the same staff and faculty participants may or may not be involved in each session. Because the work is apt to be fairly concentrated, it is expected that no major session would be longer in duration than a few weeks.

The effort of a workshop is to eventuate in a documented educational product, a product ready to be disseminated for implementation in undergraduate science curricula. Planning a workshop project should therefore be influenced by consideration of efficient means for that dissemination.

ELIGIBLE ORGANIZATIONS

The great majority of proposals for projects to improve education in the sciences received by the Foundation are submitted by colleges and universities on behalf of their staff members. Although this guide for the development of proposals gives special attention to this group, proposals may also be submitted by non-profit organizations such as professional, scientific, and educational associations or societies; research institutes and laboratories; and educational consortia. Proposals from individuals acting independently of institutional sponsorship are considered only under very exceptional circumstances.

Industrial (profit-making, commercial) organizations have not normally been recipients of Foundation support for projects to improve science education. Proposals from industry will, however, be considered for projects in which industrial personnel can provide particularly relevnt expertise, when unique resources are available in industry for the work, or when the proposed project will make a significant contribution toward improving the nature and quality of education in the sciences.

In any case, technical eligibility is generally a much less important consideration than whether the staff and facilities are appropriate and adequate for the development work to be performed. Priority will be given to institutions that have established interest and initiative in curricular innovation in the subject-matter area involved.

ELIGIBLE FIELDS

Fields for which support may be requested include the mathematical, physical, biological, medical, engineering, and social sciences, and the history and philosophy of science. Also included are interdisciplinary fields comprised of overlapping areas of two or more sciences and applied areas, especially those that relate to current issues of national concern such as management of the Nation's expanding technology, environmental control, and the scientific aspects or urban studies.

GUIDE FOR PREPARATION OF PROPOSALS

ALTERNATIVES IN HIGHER EDUCATION

I. GENERAL INFORMATION

OBJECTIVES

Included among the objectives of the Alternatives in Higher Education Program are the generation, testing, and stimulation of certain needed changes in higher education in science, mathematics and engineering. By fostering the development of experimental instructional approaches, the Program aims at making graduate and undergraduate programs more responsive and open to the diverse needs of both students and society. Support is offered for projects that develop alternatives to existing educational patterns and materials, that develop and test new modes of instruction and new delivery systems, that generate educational programs for which a demonstrated societal demand exists, that formulate and test systems for delivering continuing or recurring education to members of the scientific and technical work force, and finally, that devise means for incorporating these advances into existing education programs. In all instances, the intent is to create systems and materials that accommodate the variations in student ability, interest, and mobility, and that simultaneously prepare them for a wide range of science- and technology-based societal roles.

SCOPE

Three broad categories of activity comprise the Program: (1) Instructional Materials and Modes Development, (2) Alternative Degree Programs, and (3) Continuing Education for Scientists and Engineers.

In the past, one major avenue for improving higher education in science was the production of curriculum materials for use in a traditional lecture-recitation-laboratory format. Now priorities for support have shifted from course-content improvement in conventional science disciplines towards newly emerging, interdisciplinary and problem-relevant subject areas, as well as towards experimentation with more effective and efficient education processes. Attention is placed on approaches that promise a better matching of higher education to significant recognized academic, economic, and societal requirements.

Many different foci are possible of which some of the more prominent are:

The creation of modules, courses, curricula or instructional sequences in newly significant science- or engineering-based problem areas. Projects might be addressed to as yet unmet national needs for manpower in emerging areas of science and engineering or towards imparting new complexes of skills. A project may deal with the development of new instructional materials and course modules and/or with experimental methods of delivery, particularly those enhancing viewpoints. The substance of the course materials in the proposed plan may be problem- or case-oriented, and may be interdisciplinary in approach.

The generation, evaluation, and distribution of nontraditional materials and their requisite delivery systems. Combining curriculum

materials and technological devices has led to new learning modes and the possibility of practical self-adaptive instruction. Experiments may be proposed to examine cost-effective techniques, and to determine how to make meaningful education more readily available to students in the classrooms as well as in less conventional sites such as libraries, museums, and places of employment. Further, new hardware and new organizational structures for materials development and dissemination may be examined as alternatives to the traditional channels of publication and distribution.

The development of alternatives to discipline-oriented degrees. Starting from a thorough-going analysis of current practice, universities may propose entirely new undergraduate or graduate programs or the restructuring of existing degree programs. A significant and meaningful element of experimentation must be present, and the effort must be capable of serving as a model to other institutions.

The exploration of new techniques and systems for increasing the opportunities for and the effectiveness of continuing education for scientists and engineers. Projects may place attention on bringing continuing education to practicing scientists and engineers through the use of instructional technology, or on instituting and testing joint academic-industrial professional society cooperative arrangements. For such, cost-effectiveness and long-term viability of the proposed approaches would clearly be critical factors to be examined. In addition, projects to develop nontraditional systems for certifying the knowledge and skills of individuals could be the subject of investigation. Any project considered must be capable of fitting into a national system.

While considerable flexibility and latitude in format and subject is encouraged—be it in experimentation on alternative instructional modes, on the development of education in problem-solving competencies, on applications of modularization and self-pacing, or on the institution of a new type of doctoral program—*only those projects that convincingly demonstrate the likelihood of impact on a national scale may be considered for funding.* Efforts based on support of ongoing institutional activities, or local course improvement, or the implementation or adaptation of already developed prototype programs do not fall within this Program's responsibilities. Projects that do not take a national perspective, or whose impact is likely to be site-specific, must be excluded regardless of their intrinsic quality, or of the local need they fulfill.

ELIGIBLE ORGANIZATIONS

The great majority of proposals for projects to improve education in the sciences received by the Foundation are submitted by colleges and universities on behalf of their staff members. Although this guide for the development of proposals gives special attention to this group, proposals may also be submitted by non-profit organizations such as professional, scientific, and educational associations or societies; research institutes and laboratories; and educational consortia. Proposals from individuals acting independently of institutional sponsorship are considered only under very exceptional circumstances.

Industrial (profit-making, commercial) organizations have not normally been recipients of Foundation support for projects to improve science education. Proposals from industry will, however, be considered for projects in which industrial personnel can provide particularly relevant expertise, when unique resources are available in industry for the work, or when the proposed project will make a significant contribution toward improving the nature and quality of education in the sciences.

ELIGIBLE FIELDS

Fields for which support may be requested include the mathematical, physical, biological, medical, engineering and social sciences, and the history and philosophy of science. Also included are interdisciplinary fields comprised of overlapping areas of two or more sciences and applied areas, especially those that relate to current issues of national concern such as management of the Nation's expanding technology, environmental control, and the scientific aspects of urban studies. The Foundation does not support projects in history, social work, or in clinical or traditional business fields.

GUIDE FOR PREPARATION OF PROPOSALS

INSTRUCTIONAL IMPROVEMENT IMPLEMENTATION GRANTS FOR PRE-COLLEGE EDUCATION IN SCIENCE

I. GENERAL INFORMATION

INTRODUCTION

The National Science Foundation supports a wide variety of activities aimed at strengthening school science and mathematics programs. At the pre-college levels of education, the National Science Foundation's science education improvement activity is oriented toward two general goals: (1) development of science literacy and (2) the improvement of education for those likely to choose careers in science. Toward these goals the Foundation supports the development of carefully planned science, mathematics and social science course materials designed for applicability across the entire Nation, which school system decision-makers may examine for possible use in their classrooms. Information about the materials which have been developed with Foundation support can be obtained by requesting NSF 70-18, *Course and Curriculum Improvement Projects*. The guidelines described herein are directed to those who are concerned with the implementation of science curricula and improved instruction within their own school systems and classrooms.

PROGRAM OBJECTIVES AND MECHANISMS

The National Science Foundation invites proposals for projects designed to implement major curriculum and course developments at the pre-college level in the natural or social sciences and mathematics. Emphasis will be placed upon mechanisms for implementation where the materials and approaches to be utilized are contained in nationally recognized curricula, such as those which have been developed with the support of the National Science Foundation. However, the criteria for eligibility for implementation support rest on evidence of national prominence, potential for widespread utilization, and quality of the curriculum or course development itself, not on the source of the support for its development. Proposals for implementation of minor course and curriculum projects or those of purely local origin cannot be considered for support.

Although projects will be supported which resemble in format some of the teacher training activities (e.g., Summer or In-Service Institutes) supported in the past, their emphasis and structure will be substantially different. There will be opportunities to combine these formats in new ways and to develop new approaches for implementing science education improvements. Attention will be focused on working with key individuals and with groups of schools and school systems. Projects to provide subject matter or pedagogical training which do not include mechanisms to insure dissemination of information about or utilization of the materials or techniques in classrooms will not be supported.

It is believed that implementation projects can best be carried out through cooperative enterprises involving the scientific and educational communities. The success of implementation projects must ultimately be judged in terms of the effectiveness with which the materials and practices in question are utilized in the classrooms. Satisfactory results are most likely to be obtained when administrators, teachers, and resource personnel have participated in the planning of the activities embodied in the proposal.

It is expected that a variety of mechanisms will be employed in accomplishing the desired curric-

ulum changes. Each proposal will be expected to designate those aspects of the implementation process which are its primary concern. These might include familiarization with alternative curricula or approaches; exploration in depth of a selected curriculm for committed users; training of resource teams for long-term dissemination and maintenance; installation in a significant segment of a school system; or some other formulation of an implementation scheme most appropriate for a given local situation. Proposals should describe the elements of cooperation, coordination, and commitment existing among personnel and institutions involved. A statement of the problem(s) which the project will address should be a clearly developed part of the proposal.

Implementation projects, as defined in these guidelines, involve the interaction of human and material resources organized to introduce, demonstrate, or use and maintain instructional materials and teaching strategies designed to bring about change in specific classroom activities. The many variables inherent in activities of this nature require innovative plans of action that stress flexibility and variation in approach, depending upon the local situation.

Proposals will be accepted for implementation projects at the elementary (K-6) and secondary (7-12) level, and any combination or sub-set of these groupings. It is the intent of the Foundation to support implementation programs involving a wide spectrum of activities falling under the general headings of *dissemination and utilization*.

Dissemination of information about curriculum projects and innovative teaching practices requires that potential users of the information first be made *aware* of the content, philosophy and proper use of the materials. Ordinarily, this phase is followed by activities designed to develop an *interest* in the innovation being proposed. Both activities may, however, often be combined in a single project and/or carried out simultaneously.

The *utilization* phase of an implementation program may begin with a *pilot-trial* or preliminary evaluation of the new materials or practices to permit potential users to examine the operating characteristic of the materials as used in typical school settings.

If followed to completion, the pilot-trial phase results in the *adoption* of the materials as part of the regular program of the target school(s).

For purposes of administration, proposals will be classified by the types of implementation activities described above and by the target group directly affected. These groups include classroom teachers, school systems, and specialists. Thus, projects will generally be classified as: (1)*Leadership Specialist Projects*, (2) *Teacher Projects*, or (3) *School System Projects*.

Leadership Specialist Projects will be directed toward specialized educational personnel, such as classroom teacher-leaders, principals, supervisors, college faculty, state department of education staff members, superintendents, curriculum directors, and others who influence curriculum decisions. Projects may be designed to help them make knowledgeable decisions related to the implementation of new course materials.

Teacher Projects will be designed to bring about classroom change through teacher utilization of new instructional materials or practices.

School System Projects will be directed at bringing about specified curriculum or course changes in designated classrooms through the direct cooperation of colleges and universities and school systems willing to commit funds, personnel, and other resources in effecting these changes.

Such a classification can result in at least six different categories of proposals; or even more if the dissemination and utilization objectives are further broken down in the manner described earlier.

Implementation Objective	*Target Group*		
	Teachers	*Specialists*	*School Systems*
Dissemination	X	X	X
Utilization	X	X	X

The distribution of implementation activities across the six categories will depend upon specific user needs and program objectives; consequently, the Foundation will accept proposals for the support of projects that may involve one or more of the categories. Project organization and duration should reflect the objectives set forth in the proposal.

The above discussion of implementation activities is only illustrative. *The Foundation*

encourages originality and diversity of projects, rather than efforts to conform either to the patterns suggested or that may appear to be most commonly followed.

ELIGIBLE INSTITUTIONS

Grants for Instructional Improvement Implementation activities are ordinarily made to colleges and universities. Proposals may also be submitted by non-profit organizations such as professional, scientific, and educational associations or societies; research institutes and laboratories; and educational consortia. Proposals from individuals acting independently of institutional sponsorship are considered only under very exceptional circumstances. Schools or school systems may enter into associations with institutions of higher education in cooperative projects oriented toward improvement of the school's or school system's science program.

State or local school systems and industrial (profit-making, commercial) organizations have not normally been direct recipients of Foundation support for projects to improve science education. Proposals from these organizations will, however, be considered when the project proposed is of special concern from a national point of view and shows promise of contributing to the solution of an important problem in science education, when unique resources are available for the work, or when the proposed project is outstandingly meritorious and will make a significant contribution toward improving the nature and quality of education in the sciences. In the case of proposals from industrial organizations, support may be accomplished through the execution of a contract rather than by a grant. School systems or industrial organizations should consult the Foundation before submitting a proposal.

An institution planning to submit a proposal for implementation activities should ensure that the proposal's objectives are consistent with those of the National Science Foundation. Grants for implementation activities are designed to foster improvements in science education throughout the United States in all types of schools. While private schools may participate, the Foundation will expect proposals to emphasize improvement in science education in a public school system. Projects that are solely or principally for the benefit of nonpublic schools will be supported only under exceptional and compelling circumstances.

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Statistics that deal with the cost of living are on the up and up.

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Happiness is contagious. Are you a carrier?

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Never return a kindness; Pass it on.

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Education is discipline for the adventure of life.

GUIDE FOR PREPARATION OF PROPOSALS

MATERIALS AND INSTRUCTION DEVELOPMENT, PRE-COLLEGE

I. GENERAL INFORMATION

INTRODUCTION

The Pre-College Division of the National Science Foundation is concerned with improvement of courses and curricula in specific science disciplines and in broad interdisciplinary areas as well. The materials developed should be on topics of inherent interest to students; they should provide for a "hands on" learning approach—using real objects or physical models to illustrate intangible concepts that are difficult to grasp—and a solid foundation for later learning, whether within the formal school system or through self-generated learning outside of school. To the extent practicable they should offer superior educational return for little or no increase in investment, without significant expenditure for reorientation of school personnel.

High priority will be given to consideration of proposals for development of materials that relate science and technology to environmental and societal problems. The materials developed are expected to help citizens make effective use of the objectivity, rationality, and analytical processes characteristic of science, as well as the results of scientific discovery, in their work and personal lives, whether or not they are in scientific or technical occupations.

OBJECTIVES

The Materials and Instruction Development Section in the Division of Pre-College Education in Science encourages scientists and science educators to carry out projects for the improvement of pre-college education in mathematics, the sciences, and social sciences. The initiative for undertaking projects should arise from a recognition on the part of scientists and educators that a non-trivial problem exists with respect to education in a scientific discipline or a curriculum area with an important component of science content, and a willingness to help solve the problem. An essential condition of any such undertaking is a substantial commitment of time and effort by scientists distinguished as teachers and investigators in the disciplines (or problem areas) concerned.

SCOPE

In consonance with the goals stated in the introduction, the MID Section considers proposals for projects in science literacy at the elementary (grades K-6) level and the secondary (grades 7-12) level and for projects leading to careers in science and technology at the secondary level.

Of special interest are: (1) projects that are designed for a broad ability range of students, (2) projects that are interdisciplinary in nature, particularly those that involve the social sciences, (3) projects that relate science and technology to environmental and societal problems, (4) projects that involve application of innovative educational technologies, and (5) projects that involve experimentation with new structures and procedures in science education.

CATEGORIES OF SUPPORT

The Foundation recognizes that there is no "one best way" to go about improving education in science. Some examples of broad categories of activities for which support is appropriate include: (1) committee and conference studies designed to identify problems in a given field and to formulate guidelines for the evolution of modern instructional programs; (2) planning and coordination projects designed to develop basic guidelines for course improvement, to stimulate the initiation of appropriate projects, to correlate independent developmental projects. and to facilitate wide dissemination of the results of such efforts; (3) projects whose studies of the learning process can be expected to be useful to other study groups in developing improved curriculum materials; (4) projects for the development of course segments dealing with new approaches to subject-matter presentations through written materials, film, television, laboratory experiments and equipment, computer applications, or programmed media; (5) projects to develop models of outside-the-classroom instruction; (6) projects to develop modes of instruction which approach in a realistic way the needs of nonacademically oriented students; (7) projects to develop complete model courses or course sequences, using many types of learning and teaching aids; (8) projects designed to study the educational system with particular reference to the application of scientific principles to educational processes; and (9) evaluation projects designed to provide a record of the diffusion and implementation process for new course materials and to indicate more effective means for diffusion and implementation of the new course materials.

Still other approaches may be needed to achieve other goals. Projects should be designed and budgeted to allow the project director and his staff freedom to follow, within the overall objective of the Section, whatever paths are likely to be most fruitful in bringing about the desired aspects of educational improvement. The products or results of projects, which may include course materials, should merit the respect and confidence of the scientific and educational community in the field concerned and should be widely useful at the educational level for which they are designed.

ELIGIBLE ORGANIZATIONS

The great majority of proposals for projects to improve education in the sciences received by the Foundation are submitted by colleges and universities on behalf of their staff members. Although this guide for the development of proposals gives special attention to this group, proposals may also be submitted by non-profit organizations such as professional, scientific, and educational associations or societies; research institutes and laboratories; and educational consortia. Elementary and secondary schools, school systems, and state departments of education are usually excluded as grantees, although the involvement of schools and teachers in all phases of the development of materials is essential. Proposals from individuals acting independently of institutional sponsorship are considered only under very exceptional circumstances. Industrial (profit-making, commercial) organizations have not normally been recipients of Foundation support for projects to improve science education. Proposals from industry will, however, be considered for projects in which industrial personnel can provide particularly relevent expertise, when unique resources are available in industry for the work, or when the proposed project will make a significant contribution toward improving the nature and quality of education in the sciences.

ELIGIBLE FIELDS

Fields for which support may be requested include the mathematical, physical, biological, medical, engineering and social sciences, and the history and philosophy of science. Also included are interdisciplinary fields comprised of overlapping areas of two or more sciences. The Foundation does not support projects in history, social work, or in clinical or traditional business fields.

GUIDE FOR PREPARATION OF PROPOSALS

EDUCATIONAL PROGRAM RESTRUCTURING

I. GENERAL INFORMATION

PURPOSE AND SCOPE

The general goal of Educational Program Restructuring is to improve effectiveness and efficiency in science education. To this end, the National Science Foundation will provide support to assist in the design, development and evaluation of a few major experimental models of new approaches to the organization, management, delivery and content of science education. Emphasis will be placed on design and development for outcomes that can be evaluated and documented. The aim is the development of models that will yield generalizable and transportable outcomes, derived through systematic procedures, applicable to systems of science education. A unifying characteristic of Educational Program Restructuring is a holistic rather than fragmentary approach to problems in science education. Emphasis on the systems approach is expected to result in projects with a reasonably sharp focus and a manageable scope.

Program Areas

Experiments in Restructuring the Undergraduate Learning Environment(RULE)

Support will be provided for experiments and demonstrations of mechanisms to effect comprehensive changes in the undergraduate learning environment, leading to models for increasing the diversity of undergraduate instructional modes.

Experiments in State, Regional, or Urban Systems of Science Education(SYSTEMS)

Support will be provided for experiments and demonstrations to provide models of new approaches to the coordination of efforts of schools, colleges, universities, state and local government, and private agencies in selecting a specific objective as a target for education reform, and developing and executing a coordinated, collaborative plan for achieving it.

Experiments in Pre-Service Education of Teachers of Science (PSTEP)

Support will be provided for extensive restructuring of pre-service teacher education programs to provide models of undergraduate programs preparing teachers of science.

ELIGIBLE ORGANIZATIONS

The great majority of proposals for projects to improve education in the sciences received by the Foundation are submitted by colleges and universities on behalf of their staff members. Proposals may also be submitted by non-profit organizations such as professional, scientific, and educational associations or societies; research institutes and laboratories; and educational consortia. Proposals from individuals acting independently of institutional sponsorship are considered only under very exceptional circumstances.

ELIGIBLE FIELDS

Fields for which support may be requested include the mathematical, physical, biological, medical, engineering, and social sciences, and the history and philosophy of science. Also included

are interdisciplinary fields comprised of overlapping areas of two or more sciences and applied areas, especially those that relate to current issues of national concern such as management of the Nation's expanding technology, environmental control, and the scientific aspects of urban studies. The Foundation does not support projects in history, social work, or in clinical or traditional business fields.

TYPE AND DURATION OF AWARDS

The level of support and duration of a project will be determined by the scope and magnitude of the project.

It is important that proposers identify the costs of change, to which the Foundation may be asked to contribute, in contrast to normal operating costs. Resources to provide the costs of maintenance after termination of support should also be identified. Normally, contributions of funds, either directly or in kind from sources other than the National Science Foundation, will be expected.

Because projects involve several phases or stages of development, the National Science Foundation is willing to consider various patterns of funding of projects as they evolve. What follows describes some types of grants that will be made. The discussion is intended to be illustrative and not restrictive.

Grants will be made to assist efforts to *design* projects. Such efforts may include assessment of needs, identification of resources, analysis of problems and the development of a plan intended to bring the resources to bear on meeting the needs or solving the problems. These awards will normally be for one to two years and will carry no commitment for continuation nor for support to develop the project resulting from the design. In fact, it is expected that more design grants will be made than development grants described below. Consequently, a proposal for this type of grant should indicate the intrinsic value that the analysis, assessment, and design effort will have to the proposing community, even if no further funds are forthcoming from the Foundation. Proposals for this type of grant should demonstrate that significant planning has already occurred at the expense of the proposing organization. Grants of this type are intended to support design efforts of a magnitude beyond that of the planning normally expected to occur as part of the regular activity of the proposing organization.

Support will be provided to develop a few experimental models implementing well-designed plans based on carefully assessed needs and analyzed problems in science education. An award for initial development of a project may follow a design grant described above, or may be for a project designed without prior support of the NSF. Support for a project may be requested for up to three years. The conditions of multi-year support are determined on a project-by-project basis.

Support may be requested to continue projects beyond the initial three years discussed above. Normally this additional support will be limited to projects with exceptionally high experimental value. The amount and duration of such awards will be determined on a case-by-case basis.

MONITORING AND EVALUATION

An evaluation effort will usually be an integral part of each project and may be supported as part of the project. This effort will usually be oriented to the generation of information assisting internal project decision making, the monitoring of the extent to which stated objectives are achieved, the detection of additional outcomes and the documentation and validation of the model.

In addition, the National Science Foundation may organize and fund a monitoring and evaluation effort external to the project. This effort will focus on the documentation and validation of the generalizable and transportable aspects of the project.

The development and organization of the external evaluation effort will be done in consultation with project personnel. An effort will be made to coordinate carefully the internal and external efforts.